Hidden communities of friends and foes: The importance of microbiota in human health and disease

Most of us have heard the claims that there is ten times more microbes than human cells in our bodies. Scientists in Israel published new estimates showing that the ratio is closer to 4:3 in men, and 11:5 in women.

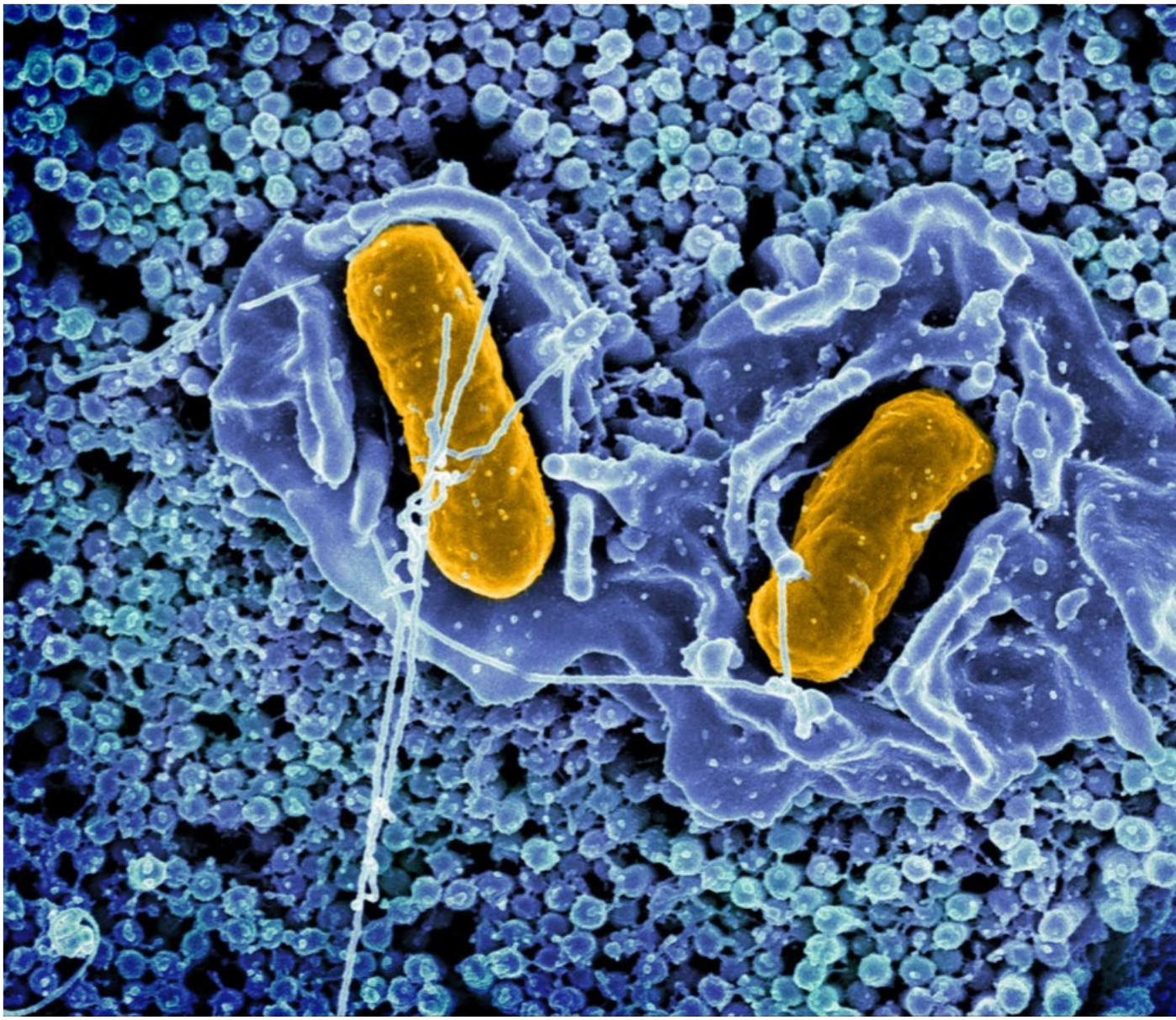
Microbiota interact with different parts of our bodies that make up their environment in ways that can be beneficial, neutral or harmful to us. Particular genre of species of micro-organisms are described as commensal, symbiotic or pathogenic, depending on the known impact on our health. They provide us with nutrients or energy by helping to break down food and even produce chemicals that can influence our mood.

Some believe their combined genomes, known as the microbiome, exert a greater influence on our health than the genes we inherit from our parents.

Contrary to the common believe that the lungs are sterile, two researchers at Imperial College London, Professor Miriam Moffatt and Professor William Cookson, investigated and characterised the microbiota in the airways of healthy people as well as patients with asthma and chronic obstructive pulmonary disease, showing that this belief couldn't be further from the truth. Certain species were correlated with asthma severity and characteristics, but it is still uncertain that different levels of bacteria are the causes of ill health or the result of it.

Other groups have shown that the outcome of cancer immunotherapy includes both efficacy and side effects are dependent on aspects of the microbiota. In addition, research has shown that those with a variety of different conditions including cardiovascular disease, type 2 diabetes, Alzheimer's and Parkinson's Disease have differences in their microbiota compared to health people. However, what is not clear is whether this is part of what has caused their ill health or just a consequence of it.

Our understanding of the microbiota is generally at species level, and we really know almost nothing about sub-species diversity which can be enormous and have big effects in the real world. Therefore, we have to be extremely cautious as we don't yet fully understand how we interact with our microbiome.



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You can read the full report in the following link: 60 years of immunology: past, present and future.